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### **Room at the inn**

The article that I had intended to write for this issue: “How faster heal time of aerification holes can add thousands of dollars to our cash flow” will be published in a later issue.

Recently during a meeting with the greens committee and GM of a golf course I was asked to explain the respiratory system of the grass plant. The answer in itself is very simple. The part of the grass plant above the surface of the soil takes in carbon dioxide and produces oxygen. The part of the plant below the surface of the soil [the roots] does the reverse and takes in oxygen and produces carbon dioxide.

In one of my previous articles for “Boardroom” [Jan-Feb 2007], I attempted to explain that in a golf green we only have two things and they are solids and pores. The pores are the spaces between the solids, and there are only two types of pores. Small pores [capillary] hold water and the larger pores [non-capillary] hold oxygen. The article went on to explain my personal way of **mentally picturing**, and understanding solids and pores by using the phrase that we need to have enough **room at the inn**, referring to the larger [non-capillary] pores as rooms used for the housing of the roots. Roots cannot live in water [capillary pores] and they can not live in solids, which means that our roots can only live in air pores [non-capillary]. I like to paint a mental picture when I do seminars of the solids are the floor, walls and ceiling of the larger [non-capillary] pores [rooms] in which the roots will reside. Let’s assume that if we have 1,000, roots than we need 1,000 rooms to house these roots [guests].

What I failed to point out in that earlier article was how the respiratory system of a grass plant works in regards to the root system breathing. Webster’s Dictionary describes “respiration” as: The processes by which a living organism or cell takes in oxygen from the air or water, distributes and utilizes it in oxidation, and gives off products of oxidation, esp. carbon dioxide. In other words a grass plant functions exactly like we humans do. Takes in Oxygen and puts out carbon dioxide.

If the room in which the roots are living or the room in which we humans were residing were sealed off and no new oxygen could enter [exchange of gasses] we would affix ate ourselves and die. Before a plant dies it will suffer stress and this stress results in a deficiency in the plants immune system resulting in disease. We spend thousands of dollars every year fighting disease that we would not have to fight if the plant had an adequate supply of oxygen available to the roots.

It has always been assumed that if we had an adequate amount of air pores [rooms] for the roots to live in that there would be enough oxygen available for the plants respiratory needs. In ISTRC’s work of monitoring golf greens over the last 17 years we have often seen root zone systems with adequate amounts of air pores but the plants exhibited signs of stress. Over time we came to understand that many times the larger pores [non-capillary] were adequate in number but were holding carbon dioxide and other

**BAD GUY GASSES**, and as a result there was not enough oxygen available to the plants root system for it to breath comfortable.. [543]

Once a plants breathing starts to become labored and the plant starts to spend more energy than normal on breathing, its immune system starts to weaken and it has less energy available to fight off disease and to digest and use nutrients. **OXYGEN is our most important ingredient in regards to maintaining a healthy putting service. Nothing else even comes close.**

Next article will discuss how our drain tiles when blocked [crushed and tree roots] or extended into and under water hazards cause standing water which causes BAD GUY GASSES to back up under our greens and rise to reside in our air pores. Bad Guy Gasses are in my opinion the second leading cause of green failure. [711]

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